

9 September 1988

**Maintenance—Engineering and Supply**

**ELECTROSTATIC DISCHARGE (ESD) CONTROL PROGRAM**

This regulation outlines Air Force Logistics Command (AFLC) policy and establishes responsibilities for implementing an ESD control program. The purpose of the program is to minimize the impact of ESD on equipment reliability, operational effectiveness, and life cycle costs. The program goal is to control and prevent ESD damage to sensitive Air Force electronic systems, subsystems, and equipment. This regulation requires adherence to guidelines provided in existing Department of Defense (DOD) standards, DOD handbooks, and Air Force technical orders (TO). It further defines the requirements of these standards, handbooks, and TOs; and levies additional requirements on AFLC organizations. ESD control begins with the design of new electronic equipment, continues through manufacture, assembly, and inventory, and remains in place throughout the life of the equipment, at all levels of maintenance, distribution, and use. This regulation applies to the air logistics centers (ALC), Aerospace Guidance and Metrology Center (AGMC), the Aerospace Maintenance and Regeneration Center (AMARC), Air Force Acquisition Logistics Center (AFALC), and 2750 Logistics Squadron (2750 LS). This regulation doesn't apply to US Air Force Reserve or Air National Guard units or members.

**1. Policy:**

a. This regulation applies to all organizations acquiring, distributing, maintaining, using, testing, and managing ESD sensitive (ESDS) items.

b. An effective ESD control program must be implemented according to DOD-STD-1686, DOD-HDBK-263, and TO 00-25-234 Section VII. Each center or base must assign an office of primary responsibility (OPR) to standardize its ESD control program. An effective ESD control program:

(1) Establishes a physical environment that is not prone to generating static charges and protects ESDS items from electrostatic charges located outside the environment.

(2) Identifies all electronic components and assemblies that are ESDS.

(3) Protects ESDS components in all environments (e.g., manufacturing, transportation, receiving, storage, maintenance, and operations).

(4) Establishes an operating environment in which personnel are aware of ESD problems and performs the prescribed countermeasures.

(5) Develops devices and systems with minimized ESD sensitivity. This concept shouldn't be applied at the cost of system performance degradation.

(6) Specifies that systems coming into the inventory or undergoing modification have minimal ESD sensitivity for the performance specified.

(7) Specifies that contractors follow established ESD control procedures.

(8) Establishes and maintains a continuous chain of ESD control from contractor to operating command.

(9) Provides methods to protect office equipment (computers, terminals, word processors, etc.) and software from ESD damage. This protection must be according to recommendations of the equipment manufacturer. For example, some users may want to install grounded ESD computer keyboard touch strips on personal computer, in order to prevent data and software loss.

(10) Gives high visibility attention to the ESD control program through use of appropriate poster, point of contact (POC) signs, and training films. The POC signs should be similar in content and purpose to the Equal Employment Opportunity (EEO) or foreign object damage (FOD) signs currently used; i.e., provide visibility of ESD POCs so that workers know to whom they should go to report ESD control problems or suggestions.

(11) Provides effective and appropriate ESD training to newly assigned personnel and periodic refresher training to all personnel.

No. of Printed Pages: 6

OPR: MMT (Lt S. Schaefer)

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Distribution: F, X

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c. Parts susceptible to ESD include microelectronic devices, discrete semiconductors, film resistors, resistor chips, other thick and thin film devices, and piezoelectric crystals. Items will be identified as ESDS per MIL-HDBK-773, paragraph 5.1; however, any item not specified in MIL-HDBK-773, but containing parts susceptible to ESD as noted above, should also be treated as ESDS. In addition, all ESDS items, circuit boards with ESDS items, and assemblies containing the circuit boards are treated as ESDS, until the level of assembly is such that it provides a complete electrostatic shield around the circuit boards and components, or the sensitivity of the assembly can be shown to be above 15,000 volts.

d. All individuals using ESDS items will use the material deficiency reporting (MDR) system (TO 00-35D-54) for identifying, evaluating, reporting, and correcting ESD-related problems of lower reliability, reduced operational effectiveness, high failure rates, and increased system life cycle cost.

e. If a conflict regarding ESD control between this regulation and any other AFLC regulation occurs, this regulation will take precedence.

## 2. References:

a. DOD-STD-1686, Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices).

b. DOD-HDBK-263, Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices).

c. TO 00-25-234, Section VII, General Shop Practice Requirements for the Repair, Maintenance, and Test of Electronic Equipment, Electrostatic Discharge Control.

d. MIL-HDBK-773, Electrostatic Discharge Protective Packaging.

## 3. Terms Explained. (See references for a wider list of definitions):

a. **Electrostatic Discharge (ESD).** A destructive transfer of static electrical charge between bodies at different electrical potentials, either by direct contact or induced by an electrostatic field.

b. **ESD Sensitive (ESDS) Item.** An electrical or electronic part, assembly, or piece of equipment that is susceptible to damage from ESD.

4. **Background.** The continuing trend toward larger scales of electronic circuit integration, such as the very high speed integrated circuit (VHSIC) technology, has led to a proliferation of ESDS products

throughout industry and DOD. These devices are easily damaged by electrostatic discharges occurring well below the limits of human sensitivity. Unless the damage is catastrophic, it will often go undetected; however, the systems of which these components are a part may unknowingly have reduced reliability, higher support costs, intermittent failures, and reduced mission effectiveness. These problems are due to changes in the operating characteristics and parameters of the integrated circuits.

## 5. Responsibilities Assigned:

a. **Directorate of Reliability, Maintainability, and Technology Policy (HQ AFLC/MMT).** Is designated as the AFLC OPR for ESD Policy. This POC is known as the Headquarters ESD Control Program Manager and must:

(1) Maintain and distribute a listing of ESD POCs. This includes POCs in HQ AFLC/DS/MA/SC; and at the ALCs, AGMC, AFALC, CASC, AMARC, and 2750 ABW.

(2) Review the ESD control programs developed by each ALC and AGMC to ensure compliance with DOD-STD-1686, DOD-HDBK-263, MIL-HDBK-773, and TO 00-25-234 Section VII and ensure that adequate depot-level ESD packaging, handling, storing, receiving, repairing, and testing policies and procedures are implemented.

(3) Chair the AFLC ESD Working Group. This group is comprised of representatives from HQ AFLC/DS/MA/SC, ALC/MM/DS/MA, AGMC/MAE/DS/MA, and AFALC/ER. The working group meets annually at the various centers on a rotational basis. The agenda and OPR for these meetings is at attachment 1.

(4) Distribute ESD policies and procedures.

(5) Maintain and update this regulation.

(6) Coordinate on any HQ AFLC/DS/MA/SC ESD policies.

b. **Deputy Chief of Staff, Distribution (HQ AFLC/DS).** Acts as a headquarters office of collateral responsibility (OCR) for ESD. The name and phone number of the single POC within this organization must be given to the Headquarters ESD Control Program Manager. This POC is known as the Headquarters ESD Control Program Monitor for Distribution and must:

(1) Support the Headquarters ESD Control Program Manager by providing protective ESD packaging, handling, and storing, and receiving policies and procedures for AFLC.

(2) Participate in the AFLC ESD Working Group.

c. **Deputy Chief of Staff, Maintenance (HQ AFLC/MA).** Acts as a headquarters OCR for ESD. The name and phone number of the single POC within this organization must be given to the Headquarters

**ESD Control Program Manager.** This POC is known as the Headquarters ESD Control Program Monitor for Maintenance and must:

(1) Support the Headquarters ESD Control Program Manager by providing protective ESD maintenance policies and procedures for AFLC.

(2) Participate in the AFLC ESD Working Group.

**d. Deputy Chief of Staff, Information Systems (HQ AFLC/SC).** Acts as a headquarters OCR for ESD. The name and phone number of the single POC within this organization must be given to the Headquarters ESD Control Program Manager. This POC is known at the Headquarters ESD Control Program Monitor for Information Systems and must:

(1) Support the Headquarters ESD Control Program Manager by providing protective ESD information system policies and procedures for AFLC.

(2) Participate in the AFLC ESD Working Group.

**e. AFLC ESD Technology Center (AGMC/MAE).** Provides the AFLC ESD Technology Center which must:

(1) Act as the AFLC focal point for ESD expertise with the authority to speak for the Command on technical matters. This includes the authority to correspond directly with appropriate level offices at HQ USAF, other Air Force major commands, and other services. Information copies of correspondence going outside the Command must be sent to HQ AFLC/MMT. In addition, other AFLC offices will be informed of such correspondence as appropriate.

(2) Assist, when requested, organizations in conducting ESD failure analyses, failure assessments, failure rate studies, and cost benefit analyses.

(3) Provide, when requested, policy making organizations with technical evaluations and solutions for ESD control problems.

(4) Provide sources for ESD training materials, technical information, and proper ESD control equipment to all AFLC Centers that request it.

(5) Provide information to keep TO 00-25-234, Section VII, and other appropriate publications current.

(6) Advise requesters on the best methods for protecting office equipment (computers, terminals, word processors, etc.) from ESD damage.

(7) Develop evaluation techniques which can be used by the ESD Control Program Monitors to evaluate the effectiveness of their ESD Control Program.

(8) Provide recommendations to Air Training Command (ATC) on what ESD control training should be included in ATC-controlled courses. This must in-

clude inputs from maintenance, distribution, and information system organizations.

(9) Co-chair the AFLC ESD Working Group.

**f. Center Directorate of Materiel Management (ALC/MM) and AGMC Maintenance (AGMC/MAE).** Act as the center OPR for ESD. The names and phone numbers of the single POC within these organizations must be given to the Headquarters ESD Control Program Manager. The POC will be known at the Center ESD Control Program Manager and must:

(1) Develop and maintain an effective center ESD control program according to this regulation, DOD-STD-1686, DOD-HDBK-263, MIL-HDBK-773 and TO 00-25-234, Section VII. This program includes ESD training for initiating new workers and annual refresher training, and adequate controls in all MM-controlled facilities. The overall program must be formalized in a center MM operating instruction and one copy provided to HQ AFLC/MMT.

(2) Maintain a listing of the ESD single POCs within their center's Distribution (DS), Maintenance (MA), and Information Systems (SC) organizations.

(3) Ensure that adequate ESD control emphasis is applied by management at all times.

(4) Assist their Center's DS, MA, and SC organizations in developing their ESD training programs.

(5) Investigate, to the extent available local resources allow, ESD as a possible cause for failure when conducting failure analyses. If a positive local determination cannot be made, but ESD is highly suspected, the item must be forwarded to the AFLC ESD Technology Center for a more thorough and detailed evaluation. Appropriate ESD controls (including item-peculiar TO changes) must be implemented when justified by failure analysis and trade-off studies.

(6) Review and support their Center and Base ESD Control Programs (the OCR programs; e.g., DS, MA, and SC). This includes assisting the OCR ESD Control Program Monitors (e.g., DS, MA, and SC) in conducting surveys of work areas to determine what ESD controls are required and annual certification of those areas for compliance with ESD controls. A work area is considered certified upon issuance of an AFLC Form 80, AFLC Electrostatic Discharge (ESD) Work Area Control Compliance Certificate.

(7) Identify, with center MA support, ESD-sensitive workloads and ESDS item lists and classifications.

(8) Represent their center at the AFLC ESD Working Group.

(9) Disseminate ESD control information throughout the center.

(10) Consult with the ESD Technology Center on the adequacy of their center's ESD Control Programs.

(11) When requested, resolve ESD sensitivity of items currently in Air Force inventories not previously identified as ESDS.

(12) Ensure purchasing and contracting organizations specify that proper ESD controls (packaging, handling, shipping, etc.) are required to be used by the contractor (as identified in DOD-STD-1686) when purchasing ESDS items and equipment (as identified in DOD-HDBK-263).

(13) When no existing test data is available, direct contractors to test item ESD sensitivity according to DOD-STD-1686. Test data is provided to the acquiring activity, as specified in DOD-STD-1686

(14) Update specific product TOs and engineering drawings with appropriate warnings, notices, and instructions when an unacceptable level of system reliability due to insufficient ESD controls is experienced on those items. This can be done simply by adding a two page appendix to the regular product TO with a statement at the beginning that requires the ESD control procedures in the appendix be used throughout the assembly, disassembly, and test of that particular item.

**g. Center Directorate of Distribution (ALC/DS and AGMC/DS), 2750LS/DMS, or AMARC/DS, as appropriate.** Act as a center/base OCR for ESD. The name and phone number of the single POC within this organization must be given to the Center ESD Control Program Manager. This POC will be known as the Center ESD Control Program Monitor for Distribution and must:

(1) Develop and maintain an effective Center/Base DS ESD control program according to this regulation, DOD-STD-1686, DOD-HDBK-263, MIL-HDBK-773 and TO 00-25-234, Section VII. This program includes ESD training for initiating new workers and annual refresher training, and adequate controls in all DS-controlled facilities. The overall program is formalized in a Center/Base DS operating instruction and one copy provided to HQ AFLC/DS and the Center/Base ESD Control Program Manager.

(2) Ensure that adequate ESD control emphasis is applied by management at all times.

**h. Center Directorate of Maintenance (ALC/MA and AGMC/MA).** Acts as a Center OCR for ESD. The name and phone number of the single POC within this organization must be given to the Center ESD Control Program Manager. This POC will be known as the Center ESD Control Program Monitor for Maintenance and must:

(1) Develop and maintain an effective Center MA ESD control program according to this regulation, DOD-STD-1686, DOD-HDBK-263, MIL-HDBK-773

and TO 00-25-234, Section VII. This program must include ESD training for initiating new workers and annual refresher training, and adequate controls in all MA-controlled facilities. The overall program must be formalized in a Center MA operating instruction and one copy provided to HQ AFLC/MA and Center ESD Control Program Manager.

(2) Ensure that adequate ESD control emphasis is applied by management at all times.

(3) Consult with the Center ESD Program Manager when checking for ESD as a possible cause for failure.

(4) Support the Center ESD Control Program Manager in identifying ESD-sensitive workloads and ESDS item lists and classifications.

**i. Center Directorate of Information Systems (ALC/SC and AGMC/SC).** Acts as a Center OCR for ESD. The name and phone number of the single POC within this organization must be given to the Center ESD Control Program Manager. This POC will be known as the Center ESD Control Program Monitor for Information Systems and must:

(1) Develop and maintain an effective Center SC ESD control program according to this regulation, DOD-STD-1686, DOD-HDBK-263, MIL-HDBK-773 and TO 00-25-234, Section VII. This program minimizes the adverse effects of ESD in the operation of automatic data processing equipment at the center. The overall program must be formalized in a center SC operating instruction and one copy provided to HQ AFLC/SC and the center ESD Control Program Manager.

(2) Ensure that adequate ESD control emphasis is applied by management at all times.

(3) Monitor organic or contract maintenance of Air Force computer assets for proper ESD controls and training.

**j. Center Directorate of Contracting and Manufacturing (ALC/PM and AGMC/PM).** Ensures ESD control policies are required in maintenance, repair, and service contracts that involve electronic components computers, word processing systems, and reproducing equipment, when identified in purchase request documentation.

**k. Deputy for Engineering and Evaluation (AFALC/ER).** Provide an ESD control program POC, who will ensure that ESD control policies and design considerations are included in acquisition programs, especially in Integrated Logistics Support Plans.

**OFFICIAL**

**ALFRED G. HANSEN, General, USAF**  
*Commander*

**JAMES E. GIBBONS, Lt Colonel, USAF**  
*Director of Administration*

**1 Attachment**  
**ESD Working Group Meeting Agenda**

## **AFLC ESD WORKING GROUP MEETING AGENDA**

The following generic agenda must be followed at the annual AFLC ESD Working Group meetings. It can be tailored or modified to specific needs; however, the Working Group meetings must include as a minimum:

### **OPR**

Introduction .....	HQ AFLC/MM
Action Item Status Review .....	HQ AFLC/MM
Materiel Management Concerns .....	HQ AFLC/MM
Distribution Concerns .....	HQ AFLC/DS
Maintenance Concerns .....	HQ AFLC/MA
Review of Host Center's ESD Control Policies and Facilities .....	Host Center
Miscellaneous Concerns and Discussions .....	Everyone
Action Items Assigned .....	HQ AFLC/MM

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SUBJ: INTERIM MESSAGE CHANGE 92-1 TO AFLCR 65-8, 9 SEPTEMBER 1988

1. EFFECTIVE 1 JULY 1992, AFLCR 65-8 BECOMES AFMCR 65-8. ALL REFERENCES TO AFLC OR AFSC BECOME AFMC EFFECTIVE THAT DATE. PLEASE ANNOTATE ACCORDINGLY.

2. CHANGE REFERENCES FOR AFLC FORM 80 TO READ AFMC FORM 370.

3. POINT OF CONTACT IS MR RANDAL DANNENFELSER, HQ AFMC{I}/ENST, DSN 787-5582.

F, x

DANNENFELSER/ENST/75582/18JUN92/RLT

DISC 15/CHG AFLCR 65-8 MSG

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